



Original Article

Epidemiology of Mediastinal Tumors during Six Years (2006-2012) in Rasht City

Mohammad Reza Asgary^{1*}, Manochehr Aghajanzadeh², Hosein Hemmati³, Morteza Jafari⁴

^{1*} Thoracic surgeon, Assistance professor, department of surgery, faculty of medicine, Guilan University of sciences, Rasht, Iran

² Thoracic surgeons, Professor, department of surgery, faculty of medicine, Guilan University of sciences, Rasht, Iran

³ Vascular surgeons, associate professor, department of surgery, faculty of medicine, Guilan University of sciences, Rasht, Iran

⁴ General physician, department of surgery, Guilan University of sciences, Rasht, Iran

Abstract

Mediastinal masses are relatively uncommon and continue to be an interesting diagnostic and therapeutic challenge to thoracic surgeons. Although they tend to be more common in young and middle-aged adults, numerous types of mediastinal tumors and cysts affect people of all age groups. Epidemiologic survey of mediastinal tumors can get important information for physician and health experts. In this retrospective descriptive cross sectional study, documents of 109 patients with primary diagnosis of mediastinal tumor managed in the Razi hospital between march 2006 and march 2012 were reviewed. 8 cases were excluded. Statistical analysis was done with SPSS (version 16). This study was carried out on 101 patients, the mean age was 35.84 ± 1.71 years and 56.4% of them were male. The most common mediastinal tumors were Non-Hodgkin lymphoma (30.7%), Thymoma (13.8%) and Hodgkin lymphoma (12.9%) respectively. 78.2% of tumors was in the anterior mediastinum. the most common symptoms were Cough and dyspnea; open biopsy was the most diagnostic method; CXR and CT scan were the most common imaging studies. There were seen significant differences between type of tumor and location of them ($P < 0.001$). In addition, no significant differences were seen between different location of tumor and age ($P = 0.4$) and gender ($P = 0.82$). This study showed that mediastinal tumors were common in young male adults. cough and dyspnea were the most common symptoms. In addition, lymphoma and Thymoma were the most common mediastinal tumors that were similar to previous studies.

Keywords: Prevalence, mediastinum, tumor

Introduction

Mediastinal masses are relatively uncommon and continue to be an interesting diagnostic and therapeutic challenge to thoracic surgeons. Although they tend to be more common in young and middle-

aged adults, numerous types of mediastinal tumors and cysts affect people of all age groups. (1)

The mediastinum is defined as the thoracic space that lies between the two pleural cavities. It extends from the thoracic inlet cephalad to the superior surface of the diaphragm caudad. It is bounded by the undersurface of the sternum ventrally and the anterior longitudinal spinal ligament dorsally. The paravertebral areas (the costovertebral sulci) situated bilaterally are not truly within the mediastinum, but lesions arising within these regions are classically defined in medical literature as mediastinal in origin.(2)

the mediastinum divide into anterior compartment, middle compartment and posterior compartment. The anterior compartment lies between the sternum and the anterior surface of the heart and great vessels. The visceral or middle compartment is located between the great vessels and the trachea. Posterior to these two compartments lies the paravertebral sulci bilaterally and the periesophageal area. The normal content of the anterior compartment includes the thymus gland or its remnant, the internal mammary artery and vein, lymph nodes, and fat. The middle mediastinal compartment contains the pericardium and its contents, the ascending and transverse aorta, the superior and inferior venae cavae, the brachiocephalic artery and vein, the phrenic nerves, the upper vagus nerve trunks, the trachea, the main bronchi and their associated lymph nodes, and the central portions of the pulmonary arteries and veins. The posterior compartment contains the descending aorta, esophagus, thoracic duct, azygos and hemiazygos veins, and lymph nodes. (3)

each variety of mediastinal cyst or tumor has a predilection for a specific compartment.(7) Primary mediastinal masses are a heterogeneous mixture of neoplastic, congenital, and inflammatory conditions.(8) Of surgically resected mediastinal masses, benign cysts, neurogenic tumors, and thymomas account for almost 20% each, while lymphoma and teratoma account for an additional



10% each. The remaining 20% of resected masses include granulomas, intrathoracic goiters, mesenchymal tumors, and primary carcinoma. In infants and children, the primary mediastinal masses in order of decreasing frequency are neurogenic tumors, germ cell tumors, enterogenous (foregut) cysts, lymphomas, angiomas and lymphangiomas, thymic tumors, stem cell tumors, and pleuropericardial cysts. In the adult patients, the masses in decreasing order of frequency are thymomas and thymic cysts, neurogenic tumors, germ cell tumors, lymphomas, enterogenous cysts, and pleuropericardial cysts. Although they tend to be more common in young and middle-aged adults, numerous types of mediastinal tumors and cysts affect people of all age groups. A more commonly accepted incidence of malignancy in adults with mediastinal masses ranges from 24% to 47%. In children, the overall incidence of malignancy of mediastinal masses is similar to that in adults, ranging from 35% to 50%. (6) CT is the study of choice in the overwhelming majority of cases. (10,11) knowing about common places of mediastinal tumors, is important in diagnosis of mediastinal masses and prevention of unnecessary operations (13).

With regard to the mediastinum importance as a central area of thorax and importance of its vital structures, the knowing about mediastinal masses is necessary. Therefore we studied the epidemiology of mediastinal tumors in patients with primary diagnosis of mediastinal tumor who managed in the Razi hospital between march 2006 and march 2012.

Materials and Methods

In this retrospective descriptive cross sectional study, documents of 109 patients with primary diagnosis of mediastinal tumor managed in the Razi hospital between march 2006 and march 2012 were reviewed. 8 cases were excluded. Patients were assessed with completion of charts about age, gender, type of tumor, location of tumor, location of metastasis, clinical symptoms, laboratory test results, radiologic test, and surgical types for pathologic sampling. Patients with metastatic tumors, esophageal cancer and lung cancer were excluded. Data was analyzed by SPSS software (version 16, SPSS Inc., Chicago, IL) and using Chi square and Anova test. Statistical results were considered significant in $P < 0.05$. This study was approved by the ethics committee of Guilan University of Medical Sciences.

Results

In this study, 109 patients with primary diagnosis of mediastinal tumor managed in the Razi hospital between march 2006 and march 2012 were

reviewed. 3 patients with tuberculosis, 3 patients with mediastinal cyst and 2 patients with necrotic tissue were excluded. Among 101 patients with mediastinal tumor, the mean age was 35.84 ± 1.71 years (range, 7 to 79), 57 patients (56.4%) were male and 44 patients (43.6%) were female. In 79 patients (78.2%), mediastinal tumors were located on the anterior mediastinum. Lowest location of mediastinal tumors was middle mediastinum (5%). Diagnostic methods in order of decreasing frequency were open biopsy (40 patients, 39.6%), surgical removal (36 patients, 35.6%) and transthoracic needle biopsy (25 patients, 24.8%). In our study, most common mediastinal tumor was non Hodgkin lymphoma (30.7%) and then in order of decreasing frequency were thymoma (13.8%) and Hodgkin lymphoma (12.9%) (Table 1). Cough and dyspnea were most common symptoms, computed tomography were most common radiologic method (Table 2).

Chi square test showed significant statistical difference in terms of distribution frequency of mediastinal tumor in anterior, middle and posterior mediastinum ($P < 0.001$); and lymphoma and thymoma were more common in anterior mediastinum and neurogenic tumors were more common in posterior mediastinum (Table 3). Anova test did not show significant statistical difference in terms of variables of age and frequency distribution of mediastinal tumors in three compartments of mediastinum and also Anova test did not show significant statistical difference in terms of variables of gender and frequency distribution of mediastinal tumors in three compartments of mediastinum. But Anova test showed significant statistical difference in terms of variables of age and tumor types ($P < 0.05$). Chi square test did not show significant statistical difference in terms of variables of gender and tumor types.

Discussion

Mediastinal tumors are relatively uncommon (2). In this study, we were assessed 101 patients with primary diagnosis of mediastinal tumor managed in the Razi hospital between march 2006 and march 2012. The mean age of our patients was 35 years that confirmed past studies. In the Vaziri study, the mean age was 34 years and most patients were between third and fifth decades of life (18). 56% of our patients were male that were similar to past studies. In the Temes study, 59% of patients were male and in the Adegeboye study, 73% of patients were male (17,19). This means that middle aged adult is risky group for mediastinal tumors. In our study, the most common clinical findings in order of decreasing frequency were cough, dyspnea, and fever that were approximately similar to past studies. In the Jahanshahi study, most common clinical



findings were cough, dyspnea and fever (14). Davis reported that most common clinical finding were chest pain, dyspnea, fever and cough (15). In whooley study, 69% of patients were symptomatic and the most common clinical findings were chest pain, cough and dyspnea(16).

In our study, most common mediastinal tumor was non Hodgkin lymphoma (30.7%) and followed by thymoma (13.8%) and Hodgkin lymphoma (12.9%). our results were relatively similar to other study results. In the hesami study, 89 patients with mediastinal tumors were evaluated between 2003 and 2006 that the most common mediastinal tumors were thymoma (25.8%) lymphoma (15.7%), tuberculosis (15.7%), mesenchymal cyst, lung SCC (9%), neurogenic tumor (7.6%), germ cell tumors (5.6%) and other tumors (11.2%) (13). In the jahanshahi study, 60 patients with mediastinal mass were studied between 2004 and 2009 and 65% of patients had malignant lesion and the most common mediastinal tumor was lymphoma (51.6%) (14). In the Davis Study, 400 patient were evaluated in 1987 and most common mediastinal tumors in order of decreasing frequency were thymoma (17%), lymphoma (16%), neurogenic tumor (14%) and germ cell tumors (11%) (15). in 1999 Whooley in a retrospective study, 124 patients with mediastinal mass between 1974 and 1999 were studied that common mediastinal tumors in order of decreasing frequency were thymoma (31%), germ cell tumor (23%), lymphoma (19%) , neurogenic tumor (12%) and other tumors (15%) (16). In the Adegboye study, 105 patients with mediastinal tumors were studied that the most common mediastinal tumors in order of decreasing frequency were lymphoma (21%), thymoma (18%), endocrine tumor (17%), and 57% of this tumors were benign (17).

In our study, the most mediastinal tumors were located in the anterior mediastinum and then in order of decreasing frequency in the posterior mediastinum and middle mediastinum. In the hesami study, the most common locations of mediastinal tumors in order of decreasing frequency were anterior mediastinum (66.9%), middle mediastinum (21.4%) and posterior mediastinum (15). Davis reported that most common location of mediastinal tumors was anterior mediastinum (54%) and also Whooley reported that the anterior mediastinum was the most common location of mediastinal tumors (82%) (16). Our study showed that lymphoma and thymoma were more common in the anterior mediastinum and neurogenic tumors were more common in the posterior mediastinum that this results are similar to literature (2).

Conclusion

In our study, mediastinal tumors were more common in middle aged males, and cough and dyspnea were the most common symptoms, and also lymphoma and thymoma were the most common mediastinal tumors and the anterior mediastinum was the most common location of mediastinal tumors.

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Conflict of interest: the author has no conflict of interest to declare.

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Corresponding Author: Mohammad Reza Asgary

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Appendages

Table 1- Frequency distribution of mediastinal tumor in our study

Tumor type	Frequency	%
Non Hodgkin lymphoma	31	30.7
Thymoma	14	14
Hodgkin lymphoma	13	12.9
Neurogenic tumor	11	10.9
Thyroid cancer	10	9.9
Germ cell tumor	5	4.95
Round cell tumor	4	3.96
Thymic hyperplasia	3	2.97
Teratoma	2	1.98
Rhabdomyosarcoma	1	0.99
Spindle cell tumor	1	0.99
Askin tumor	1	0.99
Fibrous tumor	1	0.99
Lipoma	1	0.99
Castle cell tumor	1	0.99
Adenocarcinoma	1	0.99
Giant cell carcinoma	1	0.99



Table 2- frequency distribution of our patient symptoms

Symptoms	Frequency	Percent
Cough	70	69.30
Dyspnea	60	59.40
Fever	54	53.46
Weight loss	39	38.61
Hemoptysis	27	26.73
Chest pain	27	26.73
Night sweating	20	19.80
Hoarseness	12	11.88
Dysphagia	8	7.92
Cervical vein distention	8	7.92
Abdominal pain	4	3.96
Anorexia	4	3.96



Table 3- frequency distribution of mediastinal tumors in tree compartments of mediastinum in our study

Tumor types	Mediastinum			Significant level
	anterior	Middle	posterior	
Non Hodgkin lymphoma	29	1	1	<0.001
Thymoma	14	0	0	
Hodgkin lymphoma	13	0	0	
Thyroid cancer	9	1	0	
Germ cell tumor	4	1	0	
Round cell tumor	4	0	0	
Teratoma	2	0	0	
Rhabdomyosarcoma	1	0	0	
Neurogenic tumor	1	2	8	
Lipoma	1	0	0	
Adenocarcinma	1	0	0	
Spindle cell tumor	0	0	1	
Askin tumor	0	0	1	
Fibrous tumor	0	0	1	
Castle cell tumor	0	0	1	
Giant cell tumor	0	0	1	
Thymic hyperplasia	0	0	3	